



The author(s) shown below used Federal funding provided by the U.S. Department of Justice to prepare the following resource:

Document Title: Forensic Markers of Physical Elder Abuse: Establishing a Medical Characterization and Identifying the Criminal Justice Approach to Investigation and Prosecution

Author(s): Jeanine Yonashiro-Cho, Zachary D. Gassoumis, Diana C. Homeier

Document Number: 252851

Date Received: April 2019

Award Number: 2013-IJ-CX-0025

This resource has not been published by the U.S. Department of Justice. This resource is being made publically available through the Office of Justice Programs' National Criminal Justice Reference Service.

Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

Final Summary Overview

Submitted to the National Institute of Justice

Award No. 2013-IJ-CX-0025

*Forensic Markers of Physical Elder Abuse: Establishing a Medical Characterization and
Identifying the Criminal Justice Approach to Investigation and Prosecution*

Diana C. Homeier, Principal Investigator

Jeanine Yonashiro-Cho
Zachary D. Gassoumis
Diana C. Homeier

PURPOSE

This study sought to: (1) document the spectrum of injuries and injury characteristics observed among physically abused older adults reported to Adult Protective Services and compare these findings to injuries found among non-abused older adults, (2) identify observable injury characteristics and abuse circumstances that healthcare providers, law enforcement and prosecutors consider to be key forensic markers of physical abuse, (3) document information and evidence integral for achieving successful criminal prosecution, and (4) describe approaches that community-based frontline workers can employ to better document evidence of physical abuse.

The study was conducted in two phases: Injury characterization and comparison by intent (Phase I) and exploration of determinants influencing criminal investigation and prosecution of cases (Phase II). Data collected in the first phase were used to inform the work conducted in the second phase. The specific methodologies employed in each phase are discussed below.

PROJECT SUBJECTS

In Phase I, 168 older adults aged 65 years and older were recruited, including 61 physically abused victims who were reported to APS for investigation of an abusive incident that occurred within the past 21 days and 107 control subjects recruited from a geriatrics outpatient clinic while they sought usual medical care. Patients were primarily English- or Spanish-speaking, though monolingual speakers of other languages were included if the interview and protocol could be conducted with a suitable interpreter. When able to understand the components of informed consent, all participants provided consent to participate; when cognitive impairment made this problematic, their assent was still sought but consent was provided by an appropriate legal proxy. Demographic characteristics of participants recruited through APS and the clinic

were reviewed periodically, so that targeted recruitment could be performed among the clinic patient pool to correct any large imbalances that arose between the two groups.

Study sample demographic characteristics are included in Table 1 (See Appendix). There were no statistically-significant differences in age, gender, language, education, or living status between APS-recruited abuse victims and clinic-recruited controls. Clinic controls were more ethnically-diverse than the APS sample and were also less likely to be U.S.-born. While the majority of subjects spoke some English, nearly one-third ($n=54$, 32%) of interviews were conducted through an interpreter. In 46% of these interviews, the interpreter was a family member who was not suspected to be perpetrator of abuse.

In Phase II, five law enforcement detectives and four prosecutors with experience working in family violence were recruited using purposive snowball sampling.

PROJECT DESIGN AND METHODS

Phase I employed a retrospective case-control design to compare injuries and physical findings observed among APS clients and clinic controls. Study research nurses, RN-certified individuals who had previous training in forensic documentation, interviewed subjects and photographed injuries and other physical findings. Data were collected on participant demographics, social and medical histories, exposure to past abuse, injuries present and injury characteristics, and if applicable, abuse encounter.

To validate appropriate assignment of cases to study arms, cases were reviewed by a three-person LEAD (Longitudinal, Expert, All Data) panel of clinicians with expertise in treating victims of family violence. LEAD panel members, who were blind to study recruitment arm, reviewed all available data gathered for each case, formed an individual opinion of whether they

believed abuse had occurred, and then discussed their opinions with one another seeking to reach a unanimous determination of whether abuse had occurred. Cases in which the LEAD panel was unable to reach a unanimous decision ($n=4$, 2%; 2 APS-recruited and 2 clinic-recruited) and/or their decision was discordant from the case recruitment source ($n=5$, 3%; 2 APS-recruited and 3 clinic-recruited) were excluded. The final analytic sample was 156 cases, which included 57 APS-recruited physical abuse cases and 99 clinic-recruited comparison cases.

Phase II involved qualitative analysis of data collected through group interviews with two Expert Panels, one comprised of detectives ($n=5$) and one of prosecutors ($n=4$), experienced in family violence cases. Detailed notes were taken during interviews by 2-3 researchers and later transcribed. Notes were combined, cleaned, and uploaded to NVivo 12.0 for analysis.

DATA ANALYSIS

Analyses for Phase I included descriptive statistics and tests of association, including t -tests and χ^2 tests of independence. In Phase II, data were independently coded by two researchers (KM, JYC) using thematic analysis and inductive approaches guided by grounded theory methodologies. Themes included both *a priori* themes drawn from study hypotheses, prior professional experiences, and scholarly literature, and deductive themes that emerged during initial analyses. Coding discrepancies were discussed until at least 90% agreement was achieved.

FINDINGS

Sample

Though clinic comparison group subjects were more racially diverse than APS clients ($p<0.001$), the groups were similar with respect to subject age, gender, education, living

arrangement, and social isolation (see Appendix Table 1). Across study arms, a similar proportion of subjects reported at least one medical condition (e.g., clotting disorders, dermatologic conditions) or medication (e.g., anticoagulants, glucocorticoids, cilostazol) that would affect injury presentation (Appendix Table 2). Having a medical condition (e.g., cardiac conditions, osteoarthritis, spinal stenosis) or medication (e.g., benzodiazepines, beta-blockers, sulfonylureas) that increased fall risk was also similar across recruitment arms. Three-quarters of the sample reported no ADL impairments ($n=119$; 76%) and 37% reported no IADL impairments ($n=57$); there were no significant differences between APS and clinic groups.

Spectrum of Injuries Observed Among APS Clients

Although they had reports of physical abuse that APS deemed to be plausible, nearly a quarter (23%; $n=13$) of APS clients did not have any physical injuries or other findings present upon examination (Appendix, Figure 1). All of these injury-absent subjects were examined within 12 days of the abusive incident; 4 subjects were examined within 7 days of the incident.

Injury prevalence was significantly higher among APS clients compared with clinic-recruited controls (77% vs. 61%; $p=0.03$; see Appendix Table 2). Among APS clients with injury, 53% had at least one ecchymosis on their upper extremities; 37% had at least one abrasion on their upper extremities; 21% had at least one ecchymosis present on their head, neck, or maxillofacial region; and 16% had at least one abrasion on their lower extremities (see Appendix Table 3). While prevalence of upper extremity ecchymoses and lower extremity abrasions were similar across recruitment groups prevalence of head, neck, and maxillofacial region ecchymoses ($p<0.01$) and upper extremity abrasions ($p=0.01$) were significantly more likely to occur among APS clients.

Head, neck, and maxillofacial swelling ($p=0.02$) and tenderness ($p=0.02$) in areas without any other injury were significantly more likely to occur among APS clients than clinic subjects. Among injured APS clients, similar areas of swelling were also observed on their upper extremities ($n=2$) and lower extremities ($n=2$); affected areas of tenderness were also observed on their upper extremities ($n=3$), trunk ($n=1$), and lower extremities ($n=1$).

Characteristics of Abuse-related Bruising

Given their prevalence among the study population, further analyses were conducted to more fully describe characteristics of bruises observed among APS clients. Though developed in parallel, many of the data categories collected through the present study were aligned with data points collected by Rosen and colleagues (2016) and used in their injury taxonomy. In an effort to further build on this work, we sought to describe observed bruises with regard to their location, size and color (see Appendix, Table 4). In all, 152 ecchymoses were observed among study participants, 84 found among APS clients and 68 among comparison group subjects.

Compared to ecchymoses observed among clinic subjects, those found among APS clients were larger, with an average length of 3.4 cm (vs. 2.0; $p<0.01$) and width of 2.8 cm (vs. 1.7; $p<0.01$). Half (50%; $n=42$) of ecchymoses found among APS clients were attributed by subjects to being struck by a person or object, and 25% ($n=21$) were attributed to being grabbed. Both of these mechanisms were significantly more likely to occur among APS clients than clinic comparison group members (both $p<0.001$). Ecchymoses observed among clinic subjects were more likely to have unknown mechanisms of origin (47.1% vs 23.8%; $p<0.01$).

Medical Perceptions of Forensic Markers of Physical Abuse

Medical professionals serving on the study LEAD panel relied upon their previous work in examining, documenting, and treating injuries inflicted through child maltreatment, intimate partner violence, and elder abuse to inform their abuse determination.

During LEAD panel discussions, clinicians often cited injury location as a rationale for probable abuse occurrence. Injuries located in protected areas, such as the inner aspects of the extremities or on the trunk were considered to be suspicious for abuse. Similarly, injuries occurring in specific patterns or constellations were often cited as suspicious, especially if they were patterns commonly associated with aggression and violence (e.g., bite marks, fingertip bruising). Injury patterns were also used to corroborate the study subject's account of the injury-causing event or mechanism. Cases involving injury patterns and characteristics incongruent with their reported mechanisms were also cited as being suspicious for abuse.

Contrary to initial expectations, LEAD panel clinicians relied more heavily on client accounts and socio-medical histories than on observable injury characteristics to inform their abuse determinations. Victim accounts alleging abuse were taken seriously and assumed to be true unless the subject was found to be an unreliable historian (e.g., cognitively impaired) or contradictory injury characteristics were observed. The absence of visible findings did not preclude abuse determination, as clinicians noted that not all assaultive actions result in observable injury. Injured subjects with vague accounts of injury cause and mechanism were sometimes considered to be suspicious for abuse, though vague injury accounting did not necessarily result in the determination that abuse had occurred. Upon examining each case, LEAD panel clinicians reported that they mentally constructed an informal abuse risk profile for each subject, accounting for the subject's injury and interaction account, cognitive,

psychological, and physiological health, functional dependency, cultural background, and other demographic characteristics. This risk profile was a contributing factor that informed their decision-making process.

Criminal Justice Perceptions of Forensic Markers of Physical Abuse

Interviewed criminal justice professionals, both detectives and prosecutors, examined physical injuries with the primary goal of corroborating victim accounts of abuse (see Appendix Table 5 for Expert Panel Themes and Concepts). While the presence and documentation of injuries were key components to building a case, the injuries themselves were often not enough to necessitate bringing a case for filing or pursuing prosecution. Alternate injury causes and explanations were considered, such as use of medications or diagnosis of a medical condition that may increase susceptibility for injury.

Information about injury severity was used by prosecutors to help determine whether cases should be filed as misdemeanors or felonies. Severity was gauged in various ways, such as the extent of needed medical intervention or the impact on victim well-being and quality-of-life. Although the concept of severity is largely defined statutorily, prosecutors appeared able to exercise some professional judgement in making these determinations. Severity also contributed to prosecutorial decision-making regarding defendant sentencing, including requests for use of enhanced sentencing penalties.

Considerations for Prosecution

As expected, each Expert Panel provided unique perspectives on investigatory and prosecutorial actions. Detectives reported differences in roles, responsibilities, and decision-

making between law enforcement and prosecutors. Though prosecutors were often involved in providing detectives with suggestions for types of data that would strengthen their case, detectives were directly responsible for gathering a majority of the evidence used in the case. Although prosecution was ultimately out of their purview, detectives acknowledged that the evidence they provide may influence prosecutorial decision-making and confidence in moving a case to prosecution. Interviewed law enforcement participants noted that it was important to adhere strictly to the law, arresting suspected perpetrators regardless of their cognitive or psychological capacity. In contrast, prosecutors had greater professional flexibility in assessing available evidence and deciding whether to pursue prosecution of defendants.

Despite these role differences, both detectives and prosecutors shared a common goal of achieving justice in cases of abuse. Successful prosecution was contingent on building a strong prosecutorial case by gathering evidence and analyzing the extent to which that evidence corroborated accounts of abuse before moving forward.

Injury documentation was one component used to corroborate accounts of abuse. The presence of an injury in a location and with characteristics congruent with the victim's account of abuse provided strong corroboration of the incident. Both detectives and prosecutors noted the benefit of documenting injuries through forensic photography. Prosecutors emphasized the utility of taking a series of photos over a period of time to document the changing presentation of injuries, acknowledging that some injury characteristics are latent at first and emerge after a few days. Documenting the timing and progression of injury healing may also provide evidence of injury severity and the extent of disruption caused by the abusive event.

Additional sources of corroborating evidence further strengthened the case for prosecution and provided a contingency in the event that the victim was unable or unwilling to

testify fully against their abuser. Barriers to victim testimony include physical or cognitive impairment as well as efforts to protect their abuser by minimizing abusive situations during testimony or recanting allegations altogether. Sources of additional corroborating evidence included interviews with witnesses to the event and its immediate impacts, such as neighbors or the first responders on the scene; transcripts of emergency calls to 9-1-1; medical records documenting past abuse or known victim vulnerabilities; and victim-abuser relationship roles and quality, both currently and longitudinally over time.

Prosecutors also noted the importance of anticipating and refuting potential arguments that may be raised by defense attorneys. Alternate explanations for injuries, including medical contributors that increase the likelihood and severity of injury, should be explored and evidence documented to respond to claims that may arise during the prosecutorial process. Information from victim medical records may provide insight on these topics and influence the likelihood that prosecution will be pursued.

Practices for Documentation

Despite our earlier expectations to the contrary, expert law enforcement panel members did not express a desire for APS workers or other social service providers to engage in specialized forensic photography or abuse investigation. Some detectives noted complications that sometimes arise if APS conducts their investigation prior to law enforcement's arrival, indicating that the APS worker's investigation may be responsible for suspected abuser reticence and lack of cooperation with law enforcement. Instead, participants suggested that APS workers and social service providers be equipped with resources to enable them to respond to allegations in a timely manner so that they might also notify law enforcement.

Nevertheless, participants noted the importance of having APS and social service workers equipped to document injuries they may encounter through their investigation. While documentation at the time of interview using smartphone cameras was viewed as being a good practice, prosecutors also suggested taking the victim to a medical facility equipped to conduct forensic photography.

SCHOLARLY PRODUCTS

This research project has resulted thus far in several scholarly products, and several additional products are in process:

- A symposium paper at the Gerontological Society of America’s annual meeting in November 2016, “Is this Abuse? Clinical Perspectives on Determining Whether Elder Physical Abuse has Occurred”, presented the LEAD panel methodology and offered some preliminary data drawn from the LEAD panel findings.
- A research poster at the International Association of Gerontology and Geriatrics World Congress in July 2017, “Clinician Insight on Injury Characteristics Suggestive of Physical Elder Mistreatment”, presented some preliminary findings on data from LEAD panel feedback forms.
- A workshop at the American Society on Aging’s Aging in America conference in March 2018, “Elder Abuse: Detection, Response, and Responsibility”, presented preliminary study findings and implications for practice.
- The project’s findings were used in part for Jeanine Yonashiro-Cho’s PhD dissertation, which was defended on May 1, 2018

- A professional workshop at the National Adult Protective Services Association Conference in August 2018, “See Something, Do Something: Describing, Documenting, and Sharing Suspicious Injuries”, presented study findings and implications for practice
- A presentation as part of a professional workshop at the National Adult Protective Services Association Conference in August 2018, “Assessing Physical Abuse Injuries Among APS Clients: A Practice-Research Collaboration Between Los Angeles APS and the University of Southern California”, presented lessons learned from our research collaboration with Adult Protective Services
- A research poster at the American Public Health Association conference in November 2018, “Characteristics of Physical Abuse Injuries Inflicted Among Community-Dwelling Older Adults”, presented study findings and implications for practice
- A symposium presentation at the Gerontological Society of America’s Annual Meeting in November 2018, “Detecting and Combating Age-Related Vulnerability and Susceptibility to Mistreatment”, presented study findings and implications for practice
- Three manuscripts are in preparation for 2019 submission, detailing: 1) physical findings, 2) LEAD panel perspectives, and 3) lessons from investigators and prosecutors.

IMPLICATIONS FOR CRIMINAL JUSTICE POLICY & PRACTICE IN THE U.S.

This study has shed light on two key findings of importance for criminal justice policy and practice. First, although APS clients were more likely than clinic cases to have injury upon examination, 23% of those seen had no detectable injuries present (see Appendix Figure 1). Each of these cases was adjudicated by a LEAD panel of clinicians with expertise in family violence and deemed to have involved abuse. Thus, this finding provides evidence that observable injuries

are not always present among physical abuse victims reported to APS, and the absence of injury need not preclude individuals from being viewed as victims of abuse, nor pose a barrier to seeking legal action against perpetrators. Evidence from the present study should strengthen prosecutors' ability to bring cases even in the absence of injury.

Second, the role of APS workers in the investigation of physical elder abuse is nuanced. It includes both careful documentation and engaging law enforcement expertise as soon as possible. Although APS is the first responder in many cases, it is important that they know that their photographic documentation of injuries may not be pervasively useful for prosecution due to privacy restrictions, and their investigation stands a chance of influencing how the suspected victim and perpetrator respond once law enforcement is involved. Immediate involvement of law enforcement and even joint investigations offer solutions to these issues.

Appendices

Forensic Markers of Physical Elder Abuse (Award No. 2013-IJ-CX-0025, Homeier, PI)

Characteristic	Total Sample (N=156)		APS (n=57)		Clinic (n=99)		<i>p</i> [†]
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Age, years (<i>M</i> ± <i>SD</i>)	76.7 ± 7.7		77.7 ± 8.5		76.1 ± 7.2		0.22 [‡]
Female	95	60.9	37	64.9	58	58.6	0.44
Race							
White	35	23.9	24	42.9	11	11.1	<0.001
Black	21	13.5	5	8.9	16	16.2	0.21
Latino	64	41.3	18	32.1	46	46.5	0.08
Asian/Pacific Islander	29	18.7	5	8.9	24	24.2	0.02
Other Race	6	3.9	4	7.1	2	2.0	0.11 [§]
Missing	1		1		0		
U.S.-born	58	37.4	34	61.8	24	24.5	<0.001
Missing	3		2		1		
English-speaking	109	70.3	44	78.6	65	65.7	0.09
Missing	1		1		0		
Education							
Less than High School	81	52.6	24	42.1	57	57.6	0.17 ^a
High School Graduate	38	24.7	18	31.6	20	20.2	0.17 ^a
College Graduate or Higher	35	22.7	13	22.8	22	22.2	0.17 ^a
Missing	2		2		0		
Lives Alone	37	23.9	15	26.8	22.0	22.2	0.65
With Partner and/or Family	104	67.1	35	61.4	69	69.7	0.46 ^b
With Other (non-Family)	14	9	6	10.5	8	8.1	0.46 ^b
Missing	1		1		0		
Socially-isolated	30	19.5	13	23.6	17	17.2	0.33
Missing	2		2		0		

Note: [†]Calculated using Pearson chi-square test for independence; [‡]Calculated using Independent samples t-test; [§]Calculated using Fisher's Exact T-test; Subjects were able to select more than one race category; ^aPearson chi-square test calculated for the table, accounting for all education variables; ^bPearson chi-square test calculated for the table, accounting for all living arrangement variables

Table 2. Health Characteristics of Study Sample by Recruitment Arm, N=156							
	Total Sample		APS		Clinic		
	(n=156)		(n=57)		(n=99)		<i>p</i> [†]
Characteristic	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%	
<u>MEDICAL HISTORY</u>							
Num. Self-reported of Medical Conditions	4.3 ± 2.5		3.7 ± 2.3		4.7 ± 2.6		0.02 [‡]
Condition affecting injury presentation	34	21.8	5	8.8	29	29.3	<0.01
Condition Increasing fall risk	116	74.4	41	71.9	75	75.8	0.60
Num. Self-reported Medications Taken	6.0 ± 3.3		5.8 ± 3.5		6.1 ± 3.2		0.56 [‡]
Medication affecting injury presentation	74	47.4	29	52.7	45	45.9	0.42
Medication increasing fall risk	114	73.1	45	81.8	69	70.4	0.12
Missing	3		2		1		
Subject has <u>at least one</u> self-reported condition or medication affecting injury presentation	93	59.6	30	52.6	63	63.6	0.18
Subject has <u>at least one</u> self-reported condition or medication affecting fall risk	144	92.3	55	96.5	89	89.9	0.14
<u>FUNCTIONAL ABILITY</u>							
No Identified ADL Impairment	119	76.3	45	79.0	74	74.8	0.55
Num. ADL Impairments (<i>M</i> ± <i>SD</i>)	0.4 ± 0.8		0.4 ± 0.9		0.3 ± 0.7		0.74 [‡]
No Identified IADL Impairment	57	37.3	24	43.6	33	33.7	0.22
Num. IADL Impairments (<i>M</i> ± <i>SD</i>)	2.2 ± 2.5		1.9 ± 2.3		2.3 ± 2.5		0.32 [‡]
Missing	3						
<u>PHYSICAL INJURIES</u>							
Injuries Present	104	66.7	44	77.2	60	60.6	0.03
Number of Injuries	2.2 ± 2.6		2.9 ± 3.0		1.8 ± 2.2		<0.01 [‡]
Note: [†] Calculated using Pearson chi-square test for independence; [‡] Calculated using Independent samples t-test							

Figure 1. Proportion of Sample Presenting with Injury, N=156

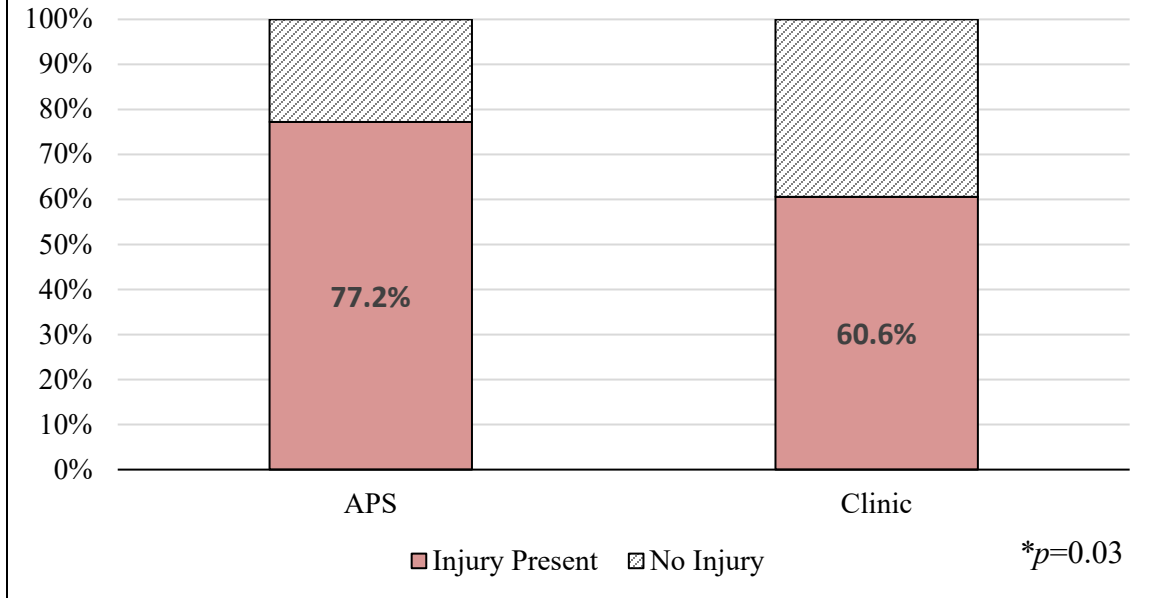


Table 3. Prevalence of Diagnoses and Locations of Injuries Reported Among Subjects with an Injury by Recruitment Source (N = 106)

	Total with Injury Present (N=106)		APS (n=43)		Clinic (n = 63)		<i>p</i> [†]
	<i>N</i>	%	<i>n</i>	%	<i>n</i>	%	
INJURY DIAGNOSIS							
Abrasion	49	46.2	20	46.5	29	46.0	0.96
Ecchymosis	60	56.6	30	69.8	30	47.6	0.02
Erythema	14	13.2	5	11.6	9	14.3	0.69
Laceration	5	4.7	3	7	2	3.2	0.36
Swelling	16	15.1	9	20.9	7	11.1	0.17
Tenderness	24	22.6	16	37.2	8	12.7	<0.01
Other Injury	25	23.6	10	23.3	15	23.8	0.95
INJURY LOCATION							
Head, Neck, Maxillofacial	32	30.2	20	46.5	12	19	<0.01
Upper Extremity	78	73.6	33	76.7	45	71.4	0.54
Trunk	15	14.2	7	16.3	8	12.7	0.60
Lower Extremity	52	49.1	16	37.2	36	57.1	0.04
DIAGNOSIS BY LOCATION							
<u>Abrasions</u>							
Head, Neck, Maxillofacial	9	8.5	3	7	6	9.5	0.64
Upper Extremity	26	24.5	16	37.2	10	15.9	0.01
Trunk	2	1.9	1	2.3	1	1.6	0.78
Lower Extremity	27	25.5	7	16.3	20	31.7	0.07
<u>Ecchymosis</u>							
Head, Neck, Maxillofacial	11	10.4	9	20.9	2	3.2	<0.01
Upper Extremity	49	46.2	23	53.5	26	41.3	0.22
Trunk	4	3.8	3	7	1	1.6	0.15
Lower Extremity	12	11.3	4	9.3	8	12.7	0.59
<u>Erythema</u>							
Head, Neck, Maxillofacial	3	2.8	1	2.3	2	3.2	0.44 [§]
Upper Extremity	4	3.8	2	4.7	2	3.2	0.36 [§]
Lower Extremity	6	5.7	2	4.7	4	6.3	0.32 [§]
<u>Laceration</u>							
Head, Neck, Maxillofacial	2	1.9	2	4.7	0	0	0.16 [§]
Upper Extremity	3	2.8	1	2.3	2	3.2	0.44 [§]
<u>Swelling</u>							
Head, Neck, Maxillofacial	4	3.8	4	9.3	0	0	0.02 [§]
Upper Extremity	2	1.9	2	4.7	0	0	0.16 [§]
Lower Extremity	8	7.5	2	4.7	6	9.5	0.20 [§]

<u>Tenderness</u>							
Head, Neck, Maxillofacial	4	3.8	4	9.3	0	0	0.02 [§]
Upper Extremity	3	2.8	3	7	0	0	0.06 [§]
Trunk	1	0.9	1	2.3	0	0	0.41 [§]
Lower Extremity	7	6.6	1	2.3	6	9.5	0.12 [§]
<u>Other Injury</u>							
Head, Neck, Maxillofacial	7	6.6	5	11.6	2	3.2	0.08 [§]
Upper Extremity	12	11.3	3	7	9	14.3	0.13 [§]
Trunk	1	0.9	0	0	1	1.6	0.59 [§]
Lower Extremity	6	5.7	3	7	3	4.8	0.29 [§]
Note: †Calculated using Pearson chi-square test for independence; §Calculated using Fisher's Exact T-test							

Table 4. Prevalence and Characteristics of Ecchymoses Reported Among Community-Dwelling Older Adults by Recruitment Source (N = 152)

	Total Sample		APS (n=84)		Clinic (n=68)		p [†]
	n	%	n	%	N	%	
<u>Location</u>							
Head, Neck & Maxillofacial	16	10.5	14	16.7	2	2.9	0.01
Upper Extremity	111	73	60	71.4	51	75	0.62
Trunk	9	5.9	5	6	4	5.9	0.99 [§]
Lower Extremity	16	10.5	5	6	11	16.2	0.04
<u>Size</u>							
Maximum Length (cm)	2.8 ± 2.5		3.4 ± 3.0		2.0 ± 1.5		<0.01 [‡]
Missing	8		4		4		
Maximum Width (cm)	2.3 ± 1.8		2.8 ± 1.8		1.7 ± 1.2		<0.01 [‡]
Missing	8		4		4		
<u>Pattern</u>							
Circular Pattern	9	6.6	5	6.9	4	6.8	0.97 [§]
Missing	21		12		9		
<u>Mechanism Causing Injury</u>							
Unknown Mechanism	52	34.2	20	23.8	32	47.1	<0.01
Grabbed by Another	21	13.8	21	25	0	0	<0.001
Fell	6	3.9	2	2.4	4	5.9	0.27 [§]
Struck by Person or Object	51	33.6	42	50	9	13.2	<0.001
Other Mechanism	27	17.8	3	3.6	24	35.3	<0.001
Missing							

Note: †Calculated using Pearson chi-square test for independence; ‡Calculated using Independent samples t-test; §Calculated using Fisher's Exact T-test; Subjects were able to select more than one race category

Table 5. Major Themes and Concepts Observed Through Law Enforcement and Prosecutor Expert Panel Interviews

Research Question	Theme	Concept
What observable injury characteristics and abuse circumstances do healthcare providers, law enforcement, and prosecutors consider key forensic markers of physical abuse?	Location	Injury location on the subject’s body and the likelihood of accidental injury to that location.
	Severity	Injury severity as evidenced through degree of physical harm, level of care necessitated, and effect on victim well-being and quality of life.
	Pattern	Injuries occurring in discernable patterns consistent with intentionally-inflicted mechanisms of abuse.
	Co-occurring Signs	Signs or symptoms commonly resulting from assault that would be expected to occur alongside the injury.
What types of information and evidence do law enforcement and prosecutors consider integral to achieving successful criminal prosecution?	Story corroboration	Importance of gathering evidence with the goal of corroborating abuse accounts through injury documentation, witness accounts, and formal records.
	Injury characteristics	Importance of documenting injury characteristics.
	Alternative explanations	Importance of exploring alternative explanations for injury occurrence, presentation, and severity.
	Compelling story	Importance of presenting the jury with a compelling and cohesive account of the abusive incident.
	Timing of Documentation	Importance of documenting evidence, including injuries, in a timely manner.
	Relationship between victim and perpetrator	Importance of exploring the roles and quality of relationship shared between the victim and abuser.
	Abuser Capacity	Importance of gathering data on the abuser’s capacity to act reasonably.
	Victim Reliability	Importance of gathering data on the victim’s reliability to provide accurate and reliable testimony regarding the abusive incident and relationship history.
	Victim Likability	Importance of victim likeability as a determinant of likelihood to proceed with abuser prosecution.
Victim Vulnerability	Importance of documenting victim vulnerability to abuse and injury	

Table 5. Major Themes and Concepts Observed Through Law Enforcement and Prosecutor Expert Panel Interviews

Research Question	Theme	Concept
	Minimize Abusive Situations	Victims sometimes minimize the abusive incident by recanting their testimony, downplaying abuse severity or its consequences, or seeking to share blame for the incident. Collection of corroborating evidence provides a contingency in the event that the victim seeks to minimize the abusive situation.
	Defense Attorney Arguments	Importance of anticipating defense attorney arguments and gathering evidence to refute or reframe their arguments.
How can APS and other service providers better document evidence of physical abuse, including observed injuries and statements by victims and witnesses?	Equipment and resources	Suggestion to better equip service providers, including APS with the resources needed to respond to victims in a timely manner and document injuries through forensic photography in the home or at a medical center.
Inductively-Derived Themes	Helping the victim	Seeking to provide support to victims through prosecutorial legal intervention and/or referral to social services providers.
	Age-perception/ageism	Use of judge and juror age-perception and “benevolent ageism” in jury selection and prosecutorial arguments.
	Challenges to investigation and prosecution	Identification of challenges to case investigation and prosecution, including complex victim-abuser relationships, cognitively-impaired abusers, and victim efforts to protect their abuser.